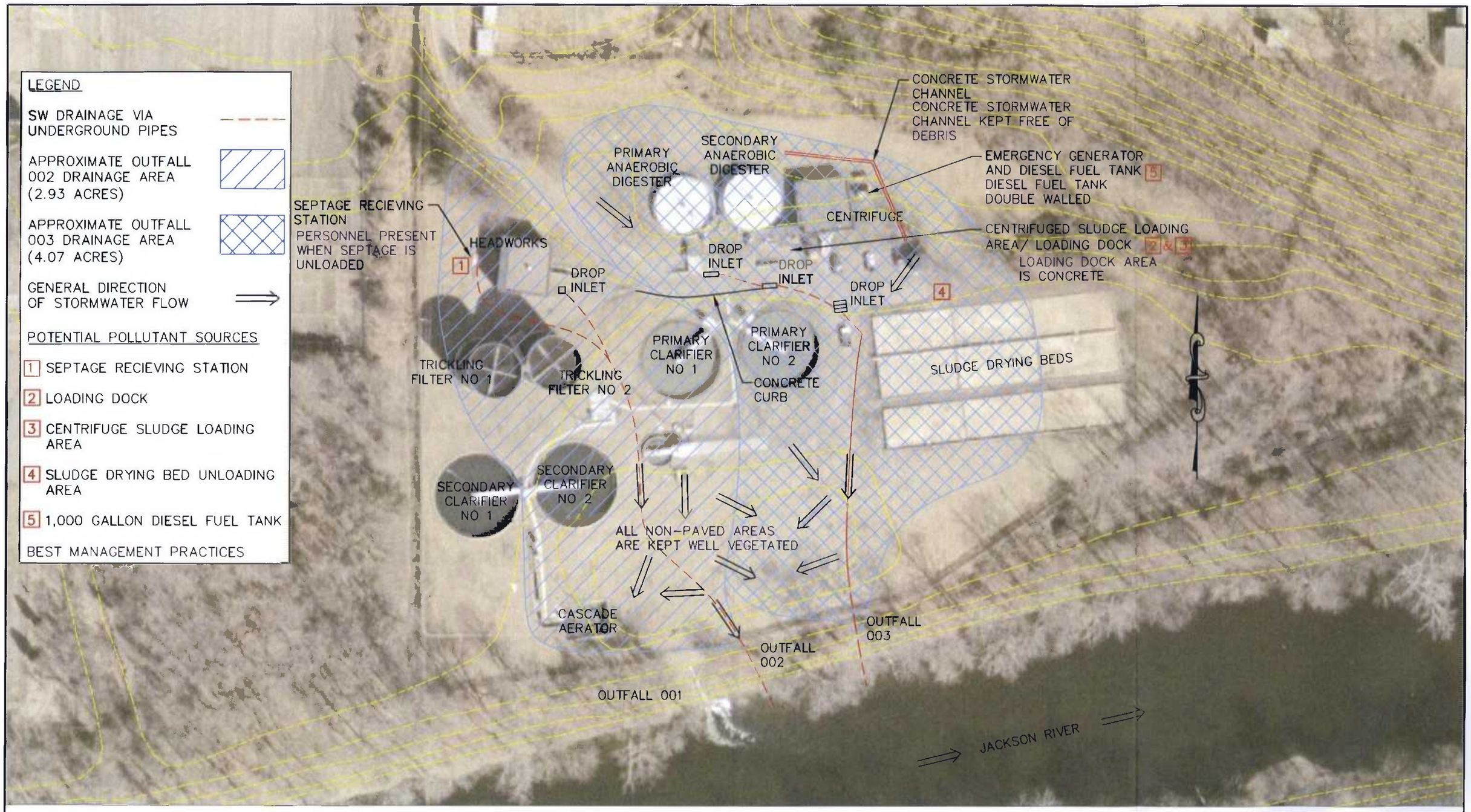
APPENDIX A

Facility Information

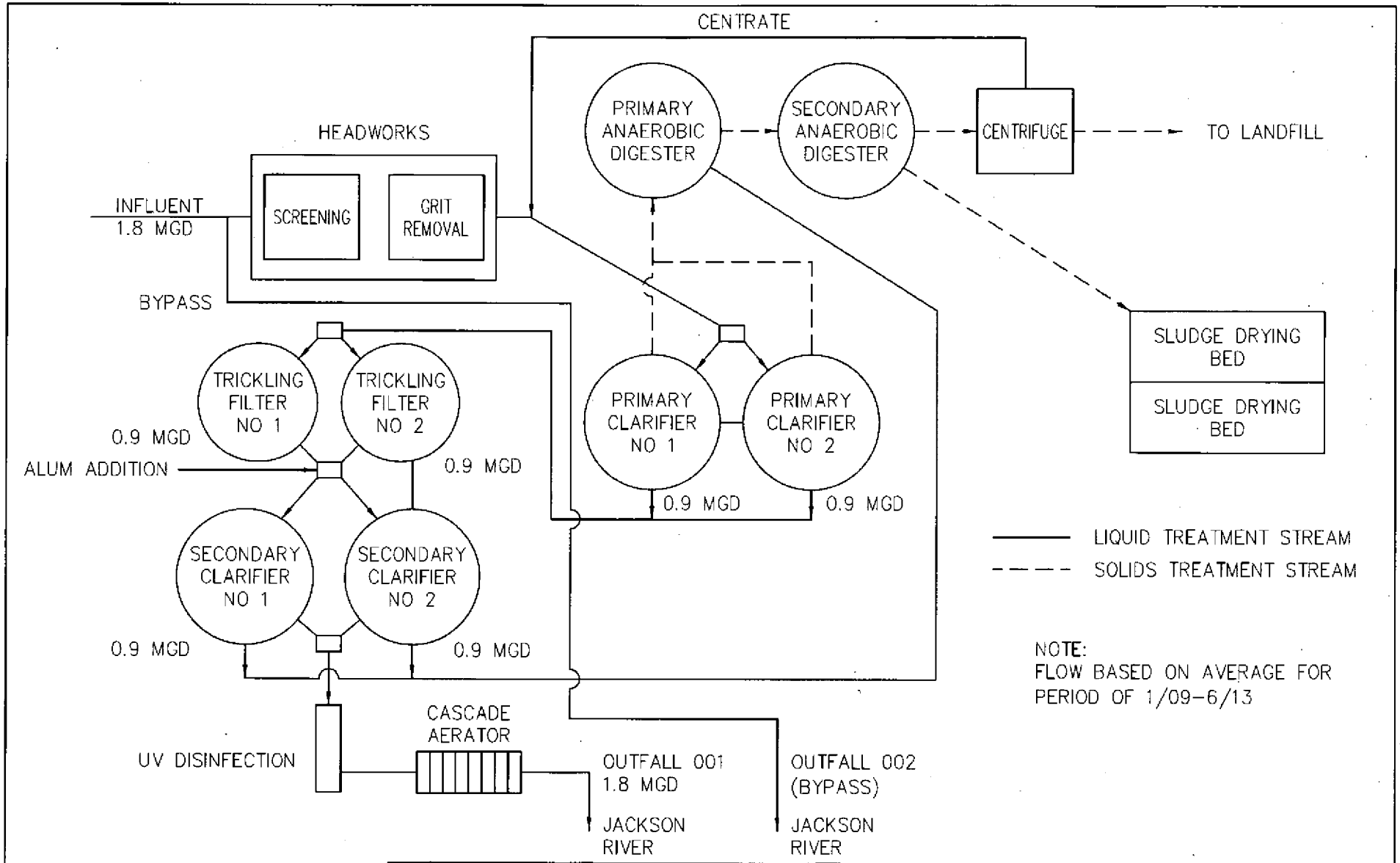
USGS Map
Flow Diagram
Site Visit Memo
Effluent Data Summary



CITY OF COVINGTON
WASTEWATER TREATMENT PLANT
FACILITIES SITE MAP

SCALE: 1"=80'
JOB NO.: 12371

OLVER INCORPORATED



CHA
1901 Innovation Drive, Suite 2100
Blacksburg, VA 24060
Main: (540) 552-5548 · www.chacompanies.com

CITY OF COVINGTON WASTEWATER TREATMENT PLANT

PROCESS FLOW DIAGRAM

PROJECT NO. 25086

DATE: 8/2013

M E M O R A N D U M

DEPARTMENT OF ENVIRONMENTAL QUALITY
West Central Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Site Visit, Covington STP, VPDES Permit No. VA0025542

TO: Kip Foster

FROM: Lewis Pillis

DATE: September 26, 2013

COPIES: file

I toured the subject facility this morning with Mr. George Jamison, Chief Operator and Lawrence Hoffman, consultant with CHA. Attention was made to location of storm water contributions, to confirm the SWPPP site map. Several surface inlets were found that are not on the site map. Most of these are in grassy areas with low potential for contamination from areas of industrial activity. Mr. Jamison is proposing to eliminate 2 inlets in the headworks area and re-grade so SW will run into a grassy area behind trickling filter No. 1. I stated that this was acceptable as long as SW does not get into the downgradient secondary clarifier. This would to minimize the risk of an accidental septage release or alum tanker unloading release. It was noted that the site map is going to be revised and sent to DEQ.

The bypass in the influent splitter box was viewed. Mr. Jamison stated that bypasses have not happened as much recently. To bypass, water has to rise about 2 feet above a metal plate in the box. Facility personnel make sure that septage and leachate delivered into the splitter box does not go into the overflow. Leachate hauling days are determined by the landfill. It was asked if they could work with the landfill to spread the delivery out evenly and not deliver 4 loads in a day. A load of leachate takes 20 to 30 minutes to unload. Bypasses discharge to the River via outfall 002, which is about 25 feet below outfall 001.

UV bulbs are cleaned periodically, historically every 4 to 6 months. Polymer being fed to the sludge fan press is Praestol K275 FLX. Sludge was being deposited into a dump truck lined with polyfilm. An asphalt curb on the road side of the loading area helps keep sludge that misses the truck contained. A surface drain is in this area that flows to the WWTP. from this area is possible. Housekeeping procedures are used to prevent sludge from being tracked from this area. A storm drain, leading to outfall 003, is present a few yards downgradient of this area.

The effluent pipe was about 2 feet above the Jackson River surface and flowed over riprap into a pool area of the River. Small rocks covered with silt were visible on the River bottom and the River width was estimated to be 150-200’.

The 2 storm water outfalls enter the River downstream of the effluent. Both have small drainage areas, but are close to the treatment units. The outlets were both above the River surface and were in need of outlet protection.

Covington - Wastewater Treatment Plant
Permit No:VA0025542

		FLOW, MGD				Overflows	BOD_5 kg/D		BOD_5 mg/L		TSS kg/D		TSS mg/L		E.COLI No/100ml
		Mo ave	Max	an ave	an max	Reported	mo ave	wk ave	mo ave	max	mo ave	wk ave	mo ave	max	Mo geo mean
	Limit =>	*3*					*340*	*510*	*30*	*45*	*340*	*510*	*30*	*45*	*126*
2010	8	1.393	2.139			?	25	27	5	5	7	10	1	2	84
	9	1.229	3.195			?	17	18	4	4	2	4	<QL	1	66
	10	1.425	3.665			?	19	24	4	5	0	1	0	0	39
	11	1.256	3.347			?	19	18	4	5	6	5	1	1	46
	12	1.297	4.121	1.32	4.12	?	17	13	3	3	5	2	1	1	78
2011	1	0.997	1.79			?	24	36	6	9	6	11	2	3	65
	2	1.134	2.442			?	29	37	7	7	4	4	1	1	32
	3	2.472	6.339			?	33	99	3	6	19	75	1	3	**184**
	4	3.022	6.24			?	79	122	6	7	99	175	6	10	80
	5	2.297	4.661			?	24	31	3	3	6	12	1	1	92
	6	1.643	2.567			?	21	31	3	5	17	44	2	5	118
	7	1.623	2.832			?	10	15	1	3	9	15	1	2	106
	8	1.533	2.006			?	15	31	2	5	17	22	3	4	9
	9	1.793	5.946			?	21	32	4	6	28	45	4	5	71
	10	1.408	2.672			?	72	92	13	16	57	87	10	11	**167**
	11	1.453	4.749			?	86	149	17	**30**	42	54	8	12	115
	12	2.17	4.884	1.79	6.3	?	82	117	9	15	70	102	8	13	92
2012	1	1.777	3.528			y	130	177	19	24	77	105	12	16	117
	2	1.803	3.715				122	159	19	29	78	105	11	13	**158**
	3	2.849	6.007			y	90	103	8	8	77	99	7	8	107
*	4	1.807	5.513				52	67	8	9	98	152	14	16	**154**
**	5	1.939	3.473				65	78	9	9	77	93	10	11	6
	6	1.61	2.262			y	49	60	8	11	48	59	8	10	8
	7	1.683	2.76				65	77	10	12	48	55	7	9	22
	8	1.941	5.416			y	52	67	7	7	45	67	6	6	27
	9	1.834	5.467			y	38	55	6	8	38	53	7	13	12
	10	1.301	1.961				46	44	9	10	33	33	7	7	15
	11	1.023	2.375				49	61	12	12	42	32	8	8	12
	12	1.303	3.546	1.74	6.0		54	59	12	14	43	59	9	11	16
2013	1	1.933	5.59			y	75	124	11	12	60	111	8	9	20
	2	1.706	5.165				69	73	11	12	70	70	11	11	11
	3	1.88	3.45				78	100	11	11	70	80	10	10	22
	4	1.853	3.213				78	85	11	15	65	76	9	10	6
	5	2.372	7.279				82	152	9	10	103	280	9	15	18
	6	2.741	6.285			y	83	108	8	10	87	119	8	11	21
	7	2.59	5.094	2.15	7.3		53	49	7	7	62	65	6	6	10

***** Phase I sewer separation complete April 2012

****** Plant upgrade complete May 2012, included UV upgrade

Covington - Wastewater Treatment Plant
Permit No:VA0025542

		pH, SU min	max
2010	8	7.1	7.6
	9	7.1	7.6
	10	7	7.6
	11	7.2	7.7
	12	7.1	7.6
2011	1	7.1	7.7
	2	7.1	7.7
	3	**7.4**	**7.9**
	4	**7.3**	**7.9**
	5	**7.3**	**7.9**
	6	7.2	7.8
	7	7.2	7.6
	8	7.1	7.6
	9	7.1	8.4
	10	7	7.5
	11	7	**7.9**
	12	7.4	8.1
2012	1	7.1	7.7
	2	7	7.8
	3	7.1	7.6
*	4	7	7.5
**	5	7	7.5
	6	6.8	7.3
	7	7	7.4
	8	7	7.5
	9	7.1	7.5
	10	7.1	7.4
	11	6.9	7.3
	12	7	7.8
2013	1	7.1	7.6
	2	7	7.6
	3	7	7.6
	4	6.8	7.4
	5	6.6	7.4
	6	6.8	7.5
	7	6.9	7.4

		pH max		
	9	8.4	1	
	12	8.1	2	
	3	7.9	3	
	4	**7.9**	**4**	90%
	5	7.9	5	
	11	7.9	6	
	6	7.8	7	
	2	7.8	8	
	12	7.8	9	
	11	7.7	10	
2011	1	7.7	11	
	2	7.7	12	
2012	1	7.7	13	
2010	8	7.6	14	
	9	7.6	15	
	10	7.6	16	
	12	7.6	17	
	7	7.6	18	
	8	7.6	19	
	3	7.6	20	
2013	1	7.6	21	
	2	7.6	22	
	3	7.6	23	
	10	7.5	24	
*	4	7.5	25	
**	5	7.5	26	
	8	7.5	27	
	9	7.5	28	
	6	7.5	29	
	7	7.4	30	
	10	7.4	31	
	4	7.4	32	
	5	7.4	33	
	7	7.4	34	
	6	7.3	35	
	11	7.3	36	

90% percentile => **7.9**

***** Phase I sewer separation complete April 2012

****** Plant upgrade complete May 2012, included UV upgrade

APPENDIX B

Receiving Stream information

Flow Frequency Determination
STOReT data
Threatened & Endangered Species Information

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
West Central Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Flow Frequency Determination, Covington STP, VA0025542

TO: File

FROM: Lewis Pillis

DATE: August 25, 2008

COPIES:

Critical flows for the gage used in preparing the permit have changed since development of the last permit. Flow frequencies for the Jackson River , below Dunlap Creek gage # 02013100 were obtained from the DEQ-Office of Surface Water Investigations Excel spreadsheet. Flows include the release from Gaithright Dam. Using the drainage area comparison, River flows of Potts Creek at the mouth were calculated by drainage areas comparison from the gage on Potts Creek. There are about 9.96 sq. mi. of drainage area between the Jackson River Gage and the discharge point. Flow from this area is calculated using the drainage area comparison to the Potts Creek gage. High flow months are January through May.

Jackson River, below Dunlap Creek, VA #02013100:
DA = 614 sqmi
1Q10 = 126 cfs HF 1Q10 = 158 cfs
7Q10 = 132 cfs HF 7Q10 = 177 cfs
30Q5 = 173 cfs
30Q10 = 142 cfs HM = 344 cfs

Potts Creek near Covington, #02014000:
DA = 153 sqmi
1Q10 = 17 cfs HF 1Q10 = 27 cfs
7Q10 = 18 cfs HF 7Q10 = 33 cfs
30Q5 = 22 cfs
30Q10 = 22 cfs HM = 61 cfs

Potts Creek at Mouth:
DA = 173.52 sqmi
1Q10 = 19 cfs HF 1Q10 = 31 cfs
7Q10 = 20 cfs HF 7Q10 = 37 cfs
30Q5 = 25 cfs
30Q10 = 23cfs HM = 69 cfs

Flow from Drainage area:
DA = 9.96 sqmi
1Q10 = 1.11 cfs HF 1Q10 = 1.76 cfs
7Q10 = 1.17 cfs HF 7Q10 = 2.15 cfs
30Q5 = 1.43 cfs
30Q10 = 1.30 cfs HM = 3.97 cfs

Covington outfall 001:

1Q10 = (126 + 19 + 1.1) = 146 cfs (95 MGD) HF 1Q10 = (158 + 31 + 1.76) = 190 cfs (123 MGD)
7Q10 = (132 + 20 + 1.17) = 154 cfs (99 MGD) HF 7Q10 = (177 + 37 + 2.15) = 217 cfs (140 MGD)
30Q5 = (173 + 25 + 1.43) = 199 cfs (129 MGD)
30Q10 = (142 + 23 + 1.30) = 166 cfs (107 MGD) HM = (344 + 69 + 3.97) = 417 cfs (270 MGD)

SITEID	NAME	PERMITNO	RECORD	BASIN	LATLONG	QUAD	OPR	COUNTY	REGION	DAAREA	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	HFMTHS	TATPERIC	YRSTRN	NOTES
02013100	Jackson River bl Dunlap Cr, at Covington, Va.	GAGE SITE	R, 1974-	James River	Lat 37 47'19", Long 80 00'02", NAD 83	Callaghan	USGS	Covington City	WCRO	614	344 y	207	177 y	158 y	173	142	132 h	126 h	89	JAN-MAY	1975-2003	2005	Flow regulated by Lake Moomaw since Dec 1979
same as in 2003 ff memo?																							
02014000	Potts Creek near Covington, Va.	GAGE SITE	R, 1929-56, 1965-	James River	Lat 37 43'44", Long 80 02'32", NAD 83	Jordon Mines	USGS	Alleghany	WCRO	153	61	46	33	27	22	20	18	17	15	JAN-MAY	1929-1956, 1966-2003	2005	
	potts Creek at Mouth		drainage area comparison to Potts Creek gage							173.52	69.2	52.2	37.4	30.6	25.0	22.7	20.4	19.3	17.0				
	Intervening drainage area between Potts Creek and Covington STP outfall 001									0.2													
	Intervening drainage area between Gage and Potts creek									9.76													
										9.96	3.97	2.99	2.15	1.76	1.43	1.30	1.17	1.11	0.98				
	Sum of all 4	VA0025542	cfs								417.2	262.2	216.6	190.4	199.4	166.0	153.6	146.4	107.0				
		VA0025542	**MGD**								**270**	**169**	**140**	**123**	**129**	**107**	**99**	**95**	**69**				
	JR GAGE, MGD									397	222	134	114	102	112	92	85	81	58				

APPENDIX C

Permit Limit Development Documents

Mixing program printout
Wasteload Allocation Spreadsheet
STATS printouts
WET Justification

APPENDIX D

TMDL Information

Benthic TMDL cover page and WLA table
Water Quality Planning Regulation excerpt
Water Quality Assessment Fact Sheets

Benthic TMDL Development for the Jackson River, Virginia

Submitted to

Virginia Department of Environmental Quality

Prepared by

THE Louis Berger Group, INC.
2445 M Street, NW
Washington, DC 20037

June 2010

Final Report

Table 7-7: Phosphorus Waste Load Allocations - Major Dischargers						
Facility Name	**VPDES Permit**	**Discharge Flow (MGD)**	**TP Conc. (mg/L)**	**TP Load Allocation (lbs/growing season)**	**PO4-P Conc. (mg/L)**	**PO4-P Load Allocation (lbs/growing season)**
MeadWestvaco	VA0003646	35	1.5	66,991	0.21*	9,379
Covington STP	VA0025542	3	0.5	1,914	0.335	1,282
Low Moor WWTP	VA0027979	0.3	1.15	440	0.7705	295
Lower Jackson River WWTP	VA0090671	2.6	0.5	1,659	0.335	1,111
			Total	**71,004**	**-**	**12,068**

*Measured as filtered orthophosphorus

Table 7-8: Total Nitrogen Waste Load Allocations During the Growing Season Major Dischargers				
Facility Name	**VPDES Permit**	**Discharge Flow (MGD)**	**TN Conc. (mg/L)**	**TN Load (lbs/growing season)**
MeadWestvaco	VA0003646	35	3.7	165,245
Covington STP	VA0025542	3	6	22,968
Low Moor WWTP	VA0027979	0.3	14	5,359
Lower Jackson River WWTP	VA0090671	2.6	6	19,906
			Total	**213,478**

The allocation for Low Moor WWTP and Lower Jackson River WWTP reflect the aggregated mass load nutrient given to Alleghany County pursuant to 9VAC 25-820-70, Part 1.B.2, otherwise referred to as a "bubble". Accordingly, compliance is determined solely on an aggregate basis rather than by comparison of individual facility waste load allocations.

In addition to the major dischargers, there are 9 active minor facilities holding active individual discharge permits in the Jackson River watershed (4 industrial facilities and 5 municipal facilities). The 4 minor industrial facilities discharge very low level of nutrients. Based on DMR data for a few industrial facilities, the average discharge TP is approximated at 0.34 mg/L and 0.14 mg/l for total nitrogen and total phosphorus, respectively. **Table 7-9** presents the WLAs for the 4 minor industrial facilities for total phosphorus and total nitrogen respectively.

			12.8				

[1]Recommended classification.

[2]Based on 2020 loads or stream assimilative capacity less 20%.

[3]Load allocation based on published NPDES permit.

[4]Percentages refer to reserve as percent of total assimilative capacity. Minimum reserve for future growth and modeling accuracy is 20% unless otherwise noted.

[5]Assimilative capacity will be determined upon completion of the ongoing study by Hydroscience, Inc.

Source: Wiley & Wilson, Inc.

TABLE B4 - SEGMENT CLASSIFICATION UPPER JAMES-JACKSON RIVER SUBAREA

Stream Name	Segment Number	Mile to Mile	Stream Classification	Comments
Back Creek	2-1	16.06-8.46	W.Q.	Main Only
Jackson River	2-1	95.70-24.90	E.L.	Main and Tributaries
Jackson River	2-2	24.90-0.00	W.Q.	Main Only
Jackson River	2-2	24.90-0.00	E.L.	Tributaries Only
James River	2-3	349.50-308.50	E.L.	Main and Tributaries
James River	2-3	308.50-279.41	E.L.	Main and Tributaries

TABLE B5 - UPPER JAMES-JACKSON RIVER SUBAREA WASTELOAD ALLOCATIONS BASED ON EXISTING DISCHARGE POINT[1]

MAP LOCATION	STREAM NAME	SEGMENT NUMBER	SEGMENT CLASSIFICATION STANDARDS	MILE to[2] MILE	DISCHARGER	VPDES PERMIT NUMBER	VPDES PERMIT LIMITS BOD_5 kg/day	303(e)[3] WASTELOAD ALLOCATION BOD_5 kg/day
1	Jackson River	2-1	E.L.	93.05-	Virginia Trout	VA0071722	N/A	Secondary
B	Warm Springs Run	2-1	E.L.	3.62-0.00	Warm Springs STP	VA0028233	9.10	Secondary
3	Back Creek	2-1	W.Q.	16.06-8.46	VEPCO	VA0053317	11.50	11.50
C	X-trib to Jackson River	2-1	E.L.	0.40-0.0	Bacova	VA0024091	9.10	Secondary
D	Hot Springs Run	2-1	E.L.	5.30-0.00	Hot Springs Reg. STP	VA0066303	51.10	Secondary
E	X-trib to Cascades Creek	2-1	E.L.	3.00-0.00	Ashwood-Healing Springs STP	VA0023726	11.30	Secondary
F	Jackson River	2-1	E.L.	50.36-	U.S. Forest Service Bolar Mountain	VA0032123	1.98	Secondary
G	Jackson River	2-1	E.L.	43.55	U.S. Army COE Morris Hill Complex	VA0032115	1.70	Secondary
H	Jackson River	2-1	E.L.	29.84-	Alleghany County Clearwater Park	VA0027955	5.70	Secondary
4	Jackson River	2-1	E.L.	25.99	Covington City Water Treatment Plant	VA0058491	N/A	Secondary

5	Jackson River	2-2	W.Q.	24.64-19.03	Westvaco	VA0003646	4,195.00	4,195.00[4]
6					Covington City[5] Asphalt Plant	VA0054411	N/A	N/A
7					Hercules, Inc[6]	VA0003450	94.00	94.00
J	Jackson River	2-2	W.Q.	19.03-10.5	Covington STP	VA0025542	341.00	341.00
K	Jackson River			10.5-0.0	Low Moor STP[7]	VA0027979	22.70	22.70
M					D.S. Lancaster CC[8]	VA0028509	3.60	3.60
L					Selma STP[9]	VA0028002	59.00	59.00
10					The Chessie System[10]	VA0003344	N/A	N/A
N					Clifton Forge STP[11]	VA0002984	227.00	227.00
11					Lydall[12]	VA0002984	6.00	6.00
P					Iron Gate STP[13]	VA0020541	60.00	60.00
8	Paint Bank Branch	2-2	E.L.	1.52	VDGIF Paint Bank Hatchery	VA0098432	N/A	Secondary
I	Jerrys Run	2-2	E.L.	6.72-	VDOT 1-64 Rest Area	VA0023159	0.54	Secondary
AA	East Branch (Sulfer Spring)	2-2	E.L.	2.16	Norman F. Nicholas	VA0078403	0.05	Secondary
BB	East Branch (Sulfer Spring)	2-2	E.L.	1.91-	Daryl C. Clark	VA0067890	0.068	Secondary
9	Smith Creek	2-2	E.L.	3.44-	Clifton Forge Water Treatment Plant	VA0006076	N/A	Secondary
O	Wilson Creek	2-2	E.L.	0.20-0.0	Cliftondale[14] Park STP	VA0027987	24.00	Secondary
2	Pheasanty Run	2-3	E.L.	0.01-	Coursey Springs	VA0006491	434.90	Secondary
Q	Grannys Creek	2-3	E.L	1.20-	Craig Spring Conference Grounds	VA0027952	3.40	Secondary
CC	X-trib to Big Creek	2-3	E.L	1.10-	Homer Kelly Residence	VA0074926	0.05	Secondary
12	Mill Creek	2-3	E.L	0.16-	Columbia Gas Transmission Corp.	VA0004839	N/A	Secondary
R	John Creek	2-3	E.L	0.20-	New Castle STP(old)	VA0024139	21.00	Secondary
S	Craig Creek	2-3	E.L	48.45-36.0	New Castle STP (new)	VA0064599	19.90	Secondary
T	Craig Creek	2-3	E.L	46.98-	Craig County Schools McCleary E.S.	VA0027758	0.57	Secondary

2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Cause Group Code: **I09R-01-BEN** **Jackson River**

Location: Jackson River mainstem from the Westvaco main processing outfall downstream to the confluence of the Jackson and Cowpasture Rivers.

City / County: Alleghany Co. Covington City

Use(s): Aquatic Life

Cause(s) / VA Category: Benthic-Macroinvertebrate Bioassessments/ 5A

The original 1996 VAW-I04R and VAW-I09R impairments were combined into one in 2002.

2010 Benthic Assessment station locations are:
2-JKS000.38 - Rt. 727 Bridge - near Iron Gate (I09R)
2-JKS006.67 - Low Water Bridge - near Dabney Lancaster CC (I09R)
2-JKS013.29 - Off Rt. 696 above Lowmoor (I09R)
2-JKS018.68 - Rt. 18 Bridge at Covington (I09R)
2-JKS020.41- Upper Horse Shoe at Rayon Terrace (I09R)
2-JKS022.78- Fudge's Bridge, Rt. 154, Covington (I09R)
2-JKS023.61 - City Park - Covington at gage (I09R)

The 1996 originally 303(d) Listed impairments to the benthic community are believed due to nutrient and organic enrichment (deposition) for 24.18 miles. Based on ambient station solids data, the nutrients and organics are mainly dissolved. Trend analysis finds a significant declining trend for total phosphorus. Maxima have been greatly reduced since 1996. These waters remain impaired until completion of the Jackson R. TMDL Study.

General Standard (Benthic):
2-JKS023.61-Bio 'IM'; Seven Virginia Stream Condition Index (VSCI) surveys (2003 - 2008) for 2010; lowest score spring 2007 32.92 and highest score 57.38 spring 2004. The spring 2006 score is 34.36. The invertebrate community at this site has been dominated by taxa that are tolerant of environments with low dissolved oxygen and high levels of organic pollution (i.e. Tubificidae, Tricladida, Chironomidae, Lumbriculidae and Simulidae). The VSCI scores display a negative alteration in the taxonomic diversity and pollution sensitivity of the benthic community. Elevated total phosphorus levels continue although maxima are reduced where 6 of 40 samples are above 0.20 mg/l - 'Observed Effect'. The maximum value is 0.40 mg/l and the lowest 0.28 mg/l. Past values above 0.20 have been greater than 1.40 mg/l. The 2008 Integrated Report (IR) assessed seven VSCI surveys (2001 - 2006); lowest score spring 2001 31.03 and highest score 52.38 spring 2004. The spring 2006 score is 34.36. 2008 elevated total phosphorus levels were 17 of 51 samples above 0.20 mg/l - 'Observed Effect'. The maximum value is 1.40 mg/l and the lowest 0.23 mg/l.

2-JKS022.78- 2010 Elevated TP values greater than 0.20 mg/l are found in two of 12 samples with excessive values ranging from 0.28 to 0.39 mg/l.

2-JKS020.41- A 2007 probability station. Bio 'IM' Two VSCI surveys (2007), average score 48.13. The invertebrate community at this site is dominated by taxa that are tolerant of environments with low dissolved oxygen and high levels of organic pollution (i.e. Tricladida and Asellidae).

2-JKS018.68- Bio 'IM'- Five VSCI surveys (2004, 2006-2008) with a 6 year average score of 54.28. The benthic community shows some improvement at this station relative to the station at City Park (2-JKS023.61). However, the benthic community remains dominated by pollution tolerant taxa. In 2010 two of 16 total phosphorus observations are greater than 0.20 mg/l; excessive values range from 0.22 to 0.3 mg/l. The 2008 assessment reports two VSCI scores from the fall of 2004 (67.3) and 2006 (51.8). 2008 assessment TP results find no elevated TP levels above 0.20 mg/l from nine observations (no additional data). The 2006 IR reported six of 18 observations greater than 0.20 mg/l. Elevated TP values ranged from 0.30 to 0.70 mg/l.

2-JKS013.29- 2010 results find an impaired condition with the lowest at 38.6 fall 2004 and the highest at 61.3 fall 2006 from six VSCI survey scores (2003, 2004, 2006 & 2007). Lower VSCI scores are the result of the low taxonomic diversity and lack of pollution sensitive taxa. The 2008 IR found impairment from four VSCI surveys (2003 - 2004 & 2006). The Low Moor station

James River Basin

through the 2008 assessment has consistently had lower assessment scores and higher numbers of pollution tolerant organisms than at 2-JKS018.68. The 2006 sample showed an increase in pollution sensitive taxa and a decrease in pollution tolerant taxa. There are no additional total phosphorous data within the 2010 data window. 2008 elevated TP levels above 0.20 mg/l are found in six of 12 samples with excessive values ranging from 0.29 to 1.41 mg/l- 'Observed Effect'.

The 2008 IR found impairment from four VSCI surveys (2003 - 2004 & 2006). The Low Moor station through the 2008 assessment has consistently had lower assessment scores and higher numbers of pollution tolerant organisms than at 2-JKS018.68.

2-JKS006.67- 2010 results find 'Full Support' from six VSCI surveys (2003-2008) with an average six year score of 61.2. There have been slight differences in scores over the six-year period. Spring scores have been lower than fall scores. Lower VSCI scores are the result of the decrease in pollution sensitive taxa. Recent improvements in the benthic community may be due to a reduction in cooling water discharge and efforts to reduce nutrient discharge to the river. One elevated TP value is found at 0.26 mg/l from six samples within the 2010 data window. Trend analysis at 2-JKS000.38 reports a significant declining trend in total phosphorus. The 2008 IR reports four VSCI surveys (2001-2004) showing overall impairment with an average score of 52.8. Elevated TP concentrations greater than 0.20 mg/l are found in eight of 21 observations ranging from 0.21 to 0.50 mg/l- 'Observed Effect'.

2-JKS000.38- The 2010 assessment finds a single elevated TP observation greater than 0.20 mg/l from 38 observations at 0.22 mg/l. The 2008 assessment reported elevated TP observations greater than 0.20 mg/l in 15 of 50 observations- 'Observed Effect'. Values above 0.20 mg/l range from 0.22 to 1.24 mg/l. Trend analysis reveals significant declining trends in bacteria, total phosphorus and nitrogen.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	0.46
VAW-I09R_JKS01A00 / Jackson River / Jackson River mainstem from the Clifton Forge STP outfall downstream to the Jackson River confluence with the Cowpasture River.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	3.48
VAW-I09R_JKS02A00 / Jackson River / Jackson River mainstem from the US 60 crossing downstream to the Clifton Forge STP outfall.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	1.71
VAW-I09R_JKS03A00 / Jackson River / Jackson River mainstem from near the mouth of Karnes Creek downstream to the US 60 crossing.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	4.62
VAW-I09R_JKS03B10 / Jackson River / Jackson River mainstem from upstream of the Lowmoor community downstream to near the mouth of Karnes Creek.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	3.18
VAW-I09R_JKS04A00 / Jackson River / Jackson River mainstem from the Covington STP outfall downstream to just above the Lowmoor community.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	5.81
VAW-I09R_JKS05A00 / Jackson River / Jackson River mainstem from downstream of the Lexington Avenue Bridge to the City of Covington STP outfall on the Jackson River.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	3.26
VAW-I09R_JKS06A00 / Jackson River / Jackson River mainstem from the watershed boundary (I04R) at the mouth of Dunlap Creek downstream to just below the Lexington Avenue Bridge.	5A Benthic-Macroinvertebrate Bioassessments		1996	2010	1.66

2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
Jackson River		Estuary* (Sq. Miles)	Reservoir* (Acres)	River* (Miles)	
Aquatic Life					
	Benthic-Macroinvertebrate Bioassessments - Total Impaired Size by Water Type:			**24.18**	

Sources:

- Industrial Point Source Discharge
- Municipal (Urbanized High Density Area)
- Municipal Point Source Discharges

*Narrative descriptions, Location and City/County describes the entire extent of the Impairment. Sizes may not represent the total overall size of the impairment in terms of stream name only.

2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Cause Group Code: **I09R-01-DO** **Jackson River**

Location: Jackson River mainstem from the Westvaco main processing outfall downstream to just above the Lowmoor community.

City / County: Alleghany Co. Covington City

Use(s): Aquatic Life

Cause(s) /
VA Category: Oxygen, Dissolved/ 5A

The original 1998 IDs, VAW-I04R and VAW-I09R, 1996 303(d) Listed dissolved oxygen impairment was combined into one in 2002 for 11.19 miles.

2008 Assessment station locations are:
2-JKS000.38 - Rt. 727 Bridge - near Iron Gate (I09R)
2-JKS013.29 - Off Rt. 696 above Lowmoor (I09R)
2-JKS018.68 - Rt. 18 Bridge at Covington (I09R)
2-JKS023.61 - City Park - Covington at gage (I09R)

Diurnal swings in dissolved oxygen cause nonsupport of the aquatic life use for a total of 11.19 miles extending from river mile 24.21 (I04R- 0.46 miles) to 13.02 (I09R- 10.73 miles) (37°46'49.59 / 079°55'40.00").

The DO impairment remains for final determination of Use support via the TMDL Study.

2-JKS023.61- The 2010 assessment reports no DO excursions of the 4 mg/l criterion from 48 measurements within the ambient monitoring program. The 2008 assessment also found no DO measurements in excess of the DO minimum criterion from 52 observations. However diurnal effects have been noted in previous assessments. The 2004 IR reports DO exceeds the WQS minimum of 4.0 mg/l in six of 26 1998 special study observations as well as those described below at 2-JKS022.15.

Elevated total phosphorus (TP) levels continue with the 2010 assessment where TP results find six of 40 observations above 0.20 mg/l- 'Observed Effect'. Excessive values range from 0.28 to 0.40 mg/l. 2008 elevated TP levels are found in 17 of 51 samples with a maximum value of 1.40 mg/l and minimum of 0.23 mg/l. 2006 TP concentrations are elevated in 25 of 48 samples with excessive values also ranging from 0.23 to 1.40 mg/l. Trend analysis reveals significant declining trends in total phosphorus.

2-JKS022.15- 2004 IR reports 1998 DO Recordings find 222 excursions of the minimum 4.0 mg/l WQS criterion from 481 measurements; Diurnal affects are noted. These data are older than 5 years.

2-JKS018.68- Twenty DO measurements find no excursions of the 4.0 mg/l criterion for the 2010 assessment. DO data within the 2008 assessment data window find no excursions of the 4.0 mg/l minimum criterion from 10 measurements. However diurnal effects have been noted in previous assessments.

Two of 16 TP samples are elevated above 0.20 mg/l with the 2010 assessment. Excessive values range from 0.22 to 0.30 mg/l. 2008 TP assessment results find no elevated TP levels from nine observations with no additional data beyond the 2006 IR. The 2006 IR reports six of 18 observations in excess of 0.20 mg/l. TP excursions ranged from 0.30 to 0.70 mg/l.

2-JKS013.29- Ambient data within the 2008 assessment data window report no excursions of the WQS criteria for DO. However diurnal effects have been noted in previous assessments. The 2008 IR reports elevated TP above 0.20 mg/l in six of 12 samples with excessive values ranging from 0.29 to 1.41 mg/l- 'Observed Effect'.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size

2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A	Oxygen, Dissolved		1996	2010	0.46
VAW-I09R_JKS04A00 / Jackson River / Jackson River mainstem from the Covington STP outfall downstream to just above the Lowmoor community.	5A	Oxygen, Dissolved		1996	2010	5.81
VAW-I09R_JKS05A00 / Jackson River / Jackson River mainstem from downstream of the Lexington Avenue Bridge to the City of Covington STP outfall on the Jackson River.	5A	Oxygen, Dissolved		1996	2010	3.26
VAW-I09R_JKS06A00 / Jackson River / Jackson River mainstem from the watershed boundary (I04R) at the mouth of Dunlap Creek downstream to just below the Lexington Avenue Bridge.	5A	Oxygen, Dissolved		1996	2010	1.66

Jackson River **Aquatic Life**	Estuary* (Sq. Miles)	Reservoir* (Acres)	River* (Miles)
Oxygen, Dissolved - Total Impaired Size by Water Type:			**11.19**

Sources:

Industrial Point Source Discharge	Municipal Point Source Discharges

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2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Cause Group Code: **I09R-01-PCB** **Jackson River**

Location: The Jackson River from the Covington water intake downstream to just above the Lowmoor community.

City / County: Alleghany Co. Covington City

Use(s): Fish Consumption

Cause(s) /
VA Category: PCB in Fish Tissue/ 5A

The 2008 Integrated Report produces the initial 303(d) Listing of these waters for a total of 12.43 miles.

2-JKS023.88 (Covington City Park) 2005 fish tissue collections find exceedances above the former WQS based PCB TV of 54 ppb (VDH 50) from a single species. Two carp are found with tissue values of 66.4 (68.0 cm) and 71.3 ppb (61.31 cm). Application of the new WQS of 20 ppb adds three additional carp sizes (63.9 cm) exceeding at 28.81 ppb, (63.2 cm) at 35.96 and (51-58 cm) at 37.48 ppb.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A PCB in Fish Tissue		2008	2020	0.46
VAW-I04R_JKS02A00 / Jackson River / Jackson River mainstem from the Covington water intake downstream to Westvaco main processing outfall.	5A PCB in Fish Tissue		2008	2020	1.24
VAW-I09R_JKS04A00 / Jackson River / Jackson River mainstem from the Covington STP outfall downstream to just above the Lowmoor community.	5A PCB in Fish Tissue		2008	2020	5.81
VAW-I09R_JKS05A00 / Jackson River / Jackson River mainstem from downstream of the Lexington Avenue Bridge to the City of Covington STP outfall on the Jackson River.	5A PCB in Fish Tissue		2008	2020	3.26
VAW-I09R_JKS06A00 / Jackson River / Jackson River mainstem from the watershed boundary (I04R) at the mouth of Dunlap Creek downstream to just below the Lexington Avenue Bridge.	5A PCB in Fish Tissue		2008	2020	1.66

Jackson River **Fish Consumption**	Estuary* (Sq. Miles)	Reservoir* (Acres)	River* (Miles)
PCB in Fish Tissue - Total Impaired Size by Water Type:			**12.43**

Sources:

Source Unknown

*Narrative descriptions, Location and City/County describes the entire extent of the Impairment. Sizes may not represent the total overall size of the impairment in terms of stream name only.

2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Cause Group Code: **I09R-02-BAC** **Jackson River**

Location: Jackson River mainstem from the Covington water intake downstream to just below the Lexington Avenue Bridge.

City / County: Alleghany Co. Covington City

Use(s): Recreation

Cause(s) /
VA Category: Escherichia coli/ 5A

The original 3.36 mile waters were 1998 303(d) listed for fecal coliform (FC) bacteria and delisted for bacteria October 2005 as approved by the U.S. EPA (Fed. ID - NA) where only one exceedance from 24 observations are reported via the 2006 Integrated Report (IR) for escherichia coli (E. coli) bacteria.

The bacteria impairment returned with the 2008 IR based on E. coli excursions at 2-JKS023.61. Data within the 2010 data window results in an additional extension of the impairment from stations 2-JKS018.68 and 2-JKS015.60. The impairment extends a total of 12.43 miles.

2-JKS023.61 (Covington City Park) 2010 results produce nine of 33 escherichia coli (E. coli) observations in excess of the 235 cfu/100 ml instantaneous criterion. Exceeding values range from 320 to 1400 cfu/100 ml. 2008 IR found four of 27 E. coli observations in excess of the 235 cfu/100 ml instantaneous criterion. Exceeding values range from 250 to 1400 cfu/100 ml.

2-JKS018.68 (Rt. 8 Bridge at Covington) Three of 12 E. coli observations exceed 235 cfu/100 ml ranging from 550 to 380 cfu/100 ml.

2-JKS015.60 (K-Mart Parking Lot, SE corner) E. coli observations exceed the 235 cfu/100 ml criterion in two of 12 observations. Exceeding values range from 250 to 450 cfu/100 ml.

Assessment Unit / Water Name / Description	Cause Category / Name		Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A	Escherichia coli		2008	2020	0.46
VAW-I04R_JKS02A00 / Jackson River / Jackson River mainstem from the Covington water intake downstream to Westvaco main processing outfall.	5A	Escherichia coli		2008	2020	1.24
VAW-I09R_JKS04A00 / Jackson River / Jackson River mainstem from the Covington STP outfall downstream to just above the Lowmoor community.	5A	Escherichia coli		2010	2020	5.81
VAW-I09R_JKS05A00 / Jackson River / Jackson River mainstem from downstream of the Lexington Avenue Bridge to the City of Covington STP outfall on the Jackson River.	5A	Escherichia coli		2010	2020	3.26
VAW-I09R_JKS06A00 / Jackson River / Jackson River mainstem from the watershed boundary (I04R) at the mouth of Dunlap Creek downstream to just below the Lexington Avenue Bridge.	5A	Escherichia coli		2008	2020	1.66

Jackson River **Recreation**	Estuary* (Sq. Miles)	Reservoir* (Acres)	River* (Miles)
Escherichia coli - Total Impaired Size by Water Type:			**12.43**

2010 Impaired Waters

Categories 4 and 5 by Basin & Stream Name*

James River Basin

Sources:

Municipal (Urbanized High Density Area)	Sanitary Sewer Overflows (Collection System Failures)	Urban Runoff/Storm Sewers

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